Sub A6

CLAIMS -

1. A method for manufacturing a device with an integrated circuit chip such as a smart card or an electronic label; this device having a support (2) associated with at least one active surface such as a chip (6) with a front face (6a) provided with at least one connection pad (12) and an opposite face (6b); this method comprising the steps consisting of: initially providing for the active circuit a thin active circuit (6) which has mechanical flexibility, such as a chip (6) or flat-screen display; keeping the thin active surface (6) fixed to a stiffening substrate (8) through its opposite face (6b) referred to as the first face; removing the active circuit (6) from its stiffening substrate (8); mounting the active circuit (6) on a final support (2); characterised by the steps consisting in:

- presenting the active circuit in an assembly composed of this thin active circuit (6) and the stiffening substrate (8);
- forming in the general plane of a face (2a) of the final support (2) a communication interface (4) having at least one element (4b) for connection with the active circuit (6), on the final support (2); then
- presenting this assembly, comprising the active circuit (6) with its stiffening substrate (8), against the communication interface (4), with the connection pad (12) against a corresponding connection element (4b; 24a, 24b);

ART 34 AMDT

SUB A6

- fixing and electrically coupling the connection pad (12) with its connection element (4b; 24a, 24b), for example by laser welding; then

- removing the stiffening substrate (8) from the opposite face (6b).

2. A method according to Claim 1, characterised in that the communication interface (4) is formed or produced in the form of an ohmic contact area (4a) and/or antenna area (24), protruding on a portion of a surface in the overall plane of the face (2a) of the final support (2).

3. A method according to Claim 1 or 2, characterised in that the pad (12) is fixed and coupled with its respective connection element (4b; 24a; 24b) by welding by means of a laser beam (16), which passes through the stiffening substrate (8) and the active circuit (6), this substrate (8) and circuit (6) being transparent to the wavelength used for the welding, this wavelength being for example 1.06 µm whilst the pad (12) and/or the connection element (4b; 24a, 24b) is fusible under the effect of this laser.

4. A method according to one of Claims 1 to 3, characterised in that the support (2) for fixing the active circuit (6) is in roll form.

5. A method according to one of Claims 1 to 4, characterised in that it includes, after the step of removing the stiffening substrate (8), a step of depositing, on the opposite face (6b), a protective film (22), for example with a thickness of 5 to 15 µm, and by lacquer printing, provided that the

ART 34 AMDT

Sub A6

communication interface has at least one ohmic contact area (4a) and a step of masking or removing the material of this film (22) on this area (4a) is possibly provided.

6. A method according to one of Claims 1 to 5, characterised by a step of cutting the assembly including the active circuit (6) and the stiffening substrate (8) into an assembly cut substantially to the dimensions of the circuit (6), before the step of presenting this assembly (6, 8).

7. A method according to one of Claims 1 to 6, characterised in that each pad (12) is fixed with its respective connection element (4b; 24a, 24b) by compression, a compression force being applied through the stiffening substrate (8) of the assembly (6, 8).

8. A method according to Claim 1 or 6, characterised in that the pad (12) is fixed and coupled with its respective connection element (4b; 24a, 24b) by welding by means of a laser beam (16), which passes through the stiffening substrate (8) and the active circuit (6), this substrate (8) and circuit (6) being transparent to the wavelengths used for the welding, this wavelength being for example 1.06 µm whilst the pad (12) and/or the connection element (4b; 24a, 24b) is fusible under the effect of this laser.

9. Tooling able to implement the method according to Claim 6, characterised in that it includes a laser with a wavelength for example of 1.06 µm, whose beam (16) is transmitted by a plurality of optical paths (20), each directed towards a respective pad (12)

ART 34 AMDT

of the active circuit (6), in order to effect welds in parallel.

10. Tooling according to Claim 9, characterised in that each optical path is produced by at least one optical fibre (20).

11. Tooling according to Claim 9 or 10, characterised in that the optical paths (20) are integrated in a tool for positioning and/or holding the assembly (6, 8) vis-à-vis the final support (2).

12. A device with an integrated-circuit chip such as a smart card (6) or electronic label; this device having a support (2) associated with at least one active circuit such as a chip (6) with a front face (6a) provided with at least one connection pad (12) and an opposite face (6b); this active circuit being a thin active circuit (6) which has mechanical flexibility, such as a chip (6) or flat-screen display, and being mounted on a final support (2); characterised in that it has:

- in the overall plane of one face (2a) of the final support (2) an interface (4) for communication with at least one element (4b) for connection with the active circuit (6), on the final support (2);
- its connection pad (12) fixed and electrically coupled against a corresponding connection element (4b; 24a, 24b), for example by laser welding.

13. A device according to Claim 12, characterised in that it has a protective film (22) with a thickness for example of 5 to 15 µm, such as a printed lacquer,

A6

with a limited extent or even over the entire surface of the support (2).

14. A device according to Claim 12 or 13, characterised in that the thickness of the connection elements and of the active circuit (6) with its pads is less than 50 microns.

Add A7